

CHAPTER 1

INTRODUCTION TO RECOVERY AND BATTLEFIELD DAMAGE ASSESSMENT AND REPAIR

Recovery and Battlefield Damage Assessment and Repair (BDAR) are separate and distinct subsets of maintenance. Both are the owning units' responsibility, both have a fundamental purpose of returning combat assets to the battlefield ASAP. The purpose of recovery is the rapid removal of a disabled vehicle from the battlefield while the purpose of BDAR is the rapid temporary repair of the vehicle in order to continue the mission or self-recover. Training for BDAR should include some training in recovery techniques. There are not any written policies for BDAR in the United States Marine Corps. Recovery vehicles, wheel and track, should carry at least one BDAR kit to aid in recovery operations.

RECOVERY

Recovery is retrieving, or freeing immobile, inoperative, or abandoned materiel from its current position and returning it to operation or to a maintenance site for repair. These actions typically involve towing, lifting, and winching. Towing is typically limited to moving vehicles to the nearest Unit Maintenance Collection Point. Recovery consists of: Self-recovery, like-recovery, and dedicated-recovery. Self-recovery actions use only the equipment's assets; like-recovery actions involve the assistance of a second, similar vehicle; and dedicated-recovery requires the assistance of a vehicle which is specifically designed and dedicated to recovery operations. Recovery also takes place during operations other than war (OOTW). Unless specifically mentioned, recovery Tactics, Techniques, and Procedures (TTP) and Doctrine, Organization, Training, Leader, Development, and Soldier (DOTLMS) considerations apply to both combat and OOTW.

SELF-VEHICLE

Self-recovery is initiated at the location a vehicle becomes mired or disabled. The operator/crew uses the basic issue items (BII) and additional authorized listing (AAL, OVE for USMC) items to perform self-vehicle recovery. Also the operator/crew can use the ~~axe to~~ cut branches to put under the tires/track to get better traction (if situation or country permits tree cutting).

When the equipment has a mechanical failure, the operator/crew will use the equipment's -10 manual to perform troubleshooting procedures with the tools available in the BII and AAL. When self-recovery fails, the operator/crew requests assistance from available like vehicles.

NOTE: By current doctrine, equipment self-recovery winches can only be used to recover the vehicle that it is mounted on. It cannot be

used to recover another mired vehicle. Dedicated recovery vehicles with trained operators will perform this function.

LIKE-VEHICLE

Like-vehicle recovery is used when self-vehicle recovery fails. The principal is to utilize another piece of equipment, of the same weight class or larger, to extract or tow the mired vehicle by use of tow bars, chains, tow cables, and Allied Kinetic Energy Recovery Rope (AKERR). The AKERR is used to extract a mired vehicle, it is not designed as a towing device. When self- and like-vehicle recovery is not practiced or available, then use dedicated recovery assets.

DEDICATED RECOVERY VEHICLE

Using a dedicated recovery vehicle is the second level of recovery. Dedicated recovery vehicles are used in situations where self/like-vehicle recovery is not possible due to the severity of the situation, safety considerations, or the inability to use like-vehicle assets employed in their primary function.

Recovery managers must ensure recovery vehicles are used only when required and returned quickly to a central location to support the unit. In addition to its recovery mission, this equipment is often used for heavy lifting required in maintenance operations. Recovery manager/supervisors must use all available resources carefully to provide sustained support.

BDAR

BDAR is the procedure used to rapidly return disabled equipment to the operational commander by

expediently fixing, bypassing, or juryrigging components. BDAR restores the minimum essential

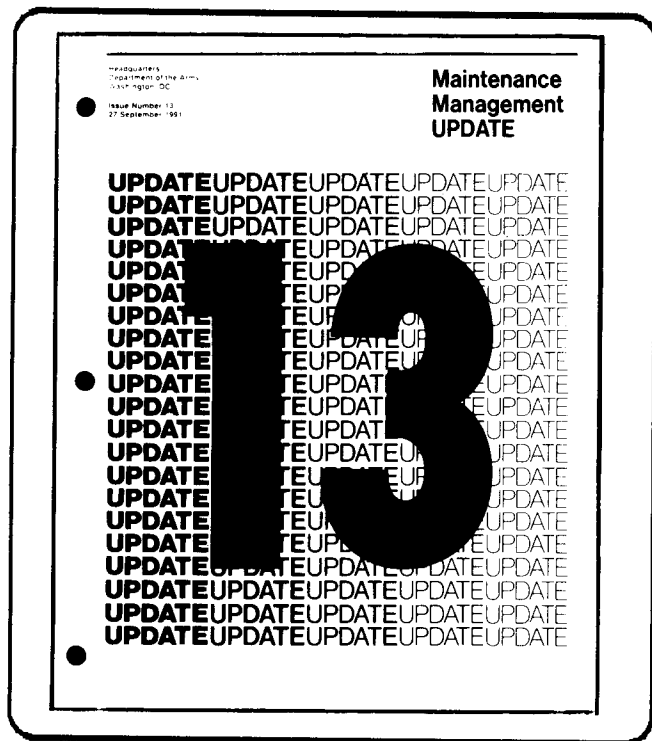


Figure 1-1. The Maintenance Management UPDATE, AR 750-1-DA Pamphlet 738-750

combat capabilities necessary to support a specific combat mission or to enable the equipment to self-recover. Depending on the repairs required and the amount of time available, repairs are temporary and may or may not restore the vehicle to fully mission capable (FMC) status. It is done by crew, maintenance teams (MT), maintenance support teams (MST), or recovery teams. BDAR will not fix all problems but has proven a 79 percent return to combat rate. BDAR fixes are not permanent repairs in accordance with AR 750-1. Replace these repairs with standard maintenance procedures as soon as possible and carry a circled X until replaced.

PEACETIME BDAR APPLICATION AND TRAINING

The Maintenance Management UPDATE, AR 750-1 (Figure 1-1), requires unit commanders to conduct non-destructive peacetime BDAR training. There are also critical soldier technical tasks that soldiers must master before performing BDAR or Recovery. Soldiers on BDAR or recovery teams must know how to read a map, handle booby traps, use the radio, and so forth. Each crewman should know how

to perform initial battle damage assessment (BDA) for his equipment and especially his crew position.

The Army maintenance standard is based on -10/-20 TMs and PMCS; there are specific occasions when peacetime BDAR can be applied. Units are encouraged to perform low-risk, nondestructive BDAR techniques during training events. A goal of Army training is to simulate combat conditions as closely as possible. It is at this time that commanders can direct the employment of BDAR for normal maintenance failures. Unit commanders should develop scenarios during training in which vehicle crews and unit/DS mechanics conduct BDAR and recovery operations. BDAR is found in individual and collective training tasks. Commanders should be aware of what MOSs require knowledge of BDAR. Company and battalion (ARTEP) tasks, especially in combat service support CSS units, require some knowledge of BDAR. Military Qualification Skills (MQS) for ordnance company grade officers also require awareness of the Army's BDAR policy and doctrine.

Peacetime BDAR training is necessary if we are to perform these vital tasks on the battlefield. Recent

military operations have highlighted how U.S. forces can be projected almost overnight into situations where combat is expected and normal logistical arrangements are rudimentary.

Equipment operators and mechanics can probably master BDAR very quickly as they have already had some maintenance and mechanic training. Vehicle crew members should be taught BDAR techniques for their specific crew stations. Cross-training of organizational and DS is also necessary. Mechanics who can change a fan belt or fuel filter can easily learn how to do expedient fixes for these same items. Experience in live-fire tests at Aberdeen Proving Ground, Maryland and at Meppen, Germany, have demonstrated that soldiers can pick up the necessary skills to perform BDAR with a minimum of training. With the adoption of TACOM ground equipment BDAR kits and easy-to-use instructions, the task of training will be even easier for the commander. Another factor in performing BDAR training is the fact that techniques outlined in BDAR TMs are simple tasks with easy to comprehend illustrations.

Training BDAR does not require expensive or complicated training aids. Unit equipment, during field exercises, can have low-risk BDAR fixes applied to them until standard maintenance can be performed, if required. Soldiers can use BDAR TMs and kits to become proficient in their use and assessment procedures. If more sophisticated or difficult tasks are to be trained, then old radiators, gas tanks, hydraulic lines, and code H vehicles and equipment are often available through local DRMO. Supervisors at all levels should use the low-, medium-, and high-risk classifications when performing such training to minimize accidents and/or damage to equipment. The unit commander makes the decision to use low-risk peacetime BDR during training.

To summarize, a unit training program should use the following outline to--

- Orient crew/operator/mechanic on BDAR doctrine and regulations.
- Train personnel in BDAR TM and kit use.

- Periodically review the following BDAR training films--

- 709741 DA TVT 9-237, Battlefield Damage Assessment and Repair - M1 Battle Damage Repair Kit.
- 709740 DA TVT 9-236, Battlefield Damage Assessment and Repair - The M2/3 Generic Battle Damage Repair Kit.
- 709742 DA TVT 9-238, Battlefield Damage Assessment and Repair, The M88 Battlefield Damage Repair Kit.

Train personnel in identifying BDAR fixes for any equipment breakdowns that can be used to restore full or partial operation. This includes--

- Installation of components from other vehicles that can be modified to fit or interchange with components in order to restore basic functional capability.

- Part fabrication, jury-rigging, and use of substitute fuels, fluids, and lubricants. Provide time in the unit training schedule to practice BDAR. During FTXs, low-risk BDAR should be allowed. Standard repair can be performed later. TACOM and ATCOM BDAR kits and training films can be used to familiarize personnel on kit utilization.

Use local materials from DRMO or other available equipment such as vehicle hulls used as range targets for hull repair. This will be especially helpful in familiarizing people with ground and aviation BDAR kits.

WAIVER OF PRECAUTIONS

In combat, BDAR/Recovery may be performed on vehicles and equipment which are fueled and/or armed. Other precautions may be waived at the discretion of the commander.

NBC ENVIRONMENT

BDAR/Recovery may be required in a chemically contaminated area or under adverse conditions with

severe limitations involving personnel, facilities, equipment, and materials. Performance of repair/recovery tasks may be necessary while wearing protective gear. If the mission does not allow for a recovery team to recover the equipment, BDAR should be kept to a minimum, then recovered to a decontamination area. After decontamination, complete repairs. FM 3-5 (FM 11-10 for USMC) contains expedient decontamination procedures.

Full MOPP reduces the efficiency of recovery personnel. Protective clothing and equipment restricts the soldier's working ability. While wearing gloves, manual dexterity and touch sensation are reduced. Wearing the mask limits sight, speech, and hearing. In accordance with FM 3-4, recovery operations are considered to be a heavy work load. Heat buildup is a major factor in doing heavy work for long periods. The rate of work may be varied using short rest periods, rotation of heavy jobs, adequate water supply, and use of vehicle transportation.

When there is not a direct threat, the protection level for tasks requiring manual dexterity, visual

acuity, and voice communication may be reduced. General guidance on the levels of MOPP and associated protective clothing and equipment are covered in the unit SOP and FM 3-4.

CAUTION:

Recovery team personnel conducting BDAR or other recovery operations (under NBC conditions) must use caution to minimize any damage to their masks, hoods, or overgarments (for example, POL spills, and so forth). Recovery teams must be aware that vehicle filters or fluid reservoirs may also contain NBC contaminants, and caution should be exercised when checking or repairing those particular components.

Recovery teams must be trained in NBC defense procedures, monitoring, and detection techniques. The teams should have extra decontamination equipment, decontaminating agents, and protective cloth-

ing. Contaminated recovered equipment could spread an agent along the evacuation route. Contaminated recovered equipment flowing forward may spread an agent along the route and pose a hazard to uncontaminated units and equipment. Commanders should keep in mind that equipment used to recover contaminated equipment will also be contaminated. Contaminated equipment should not be evacuated to clean areas until fully decontaminated. The sooner the contamination is removed, the sooner you can reduce MOPP levels and begin restoring combat power.

A complete assessment needs to be made before entering a battle damaged vehicle, vessel, or aircraft before attempting to repair any damaged equipment. Some additional environmental concern of risk could be damaged ammunition that has depleted uranium (DU) as a component material. Depleted uranium emits low-level radiation, which is mostly an internal body hazard (open wounds, ingestion, inhalation). Depleted uranium, if it enters the body, can cause heavy metal poisoning. Inform medical personnel when any injured personnel are exposed to particles of depleted uranium or any known radiation hazard.

When working in an environment which is or may be contaminated with depleted uranium, soldiers should make every effort not to have skin come into contact with depleted uranium particles: they should keep sores and open wounds covered and use protective masks, M17/M40, to prevent inhaling or ingesting depleted uranium particles. When working in or around vehicles damaged by DU ammo or vehicles with DU armor damage, wear safety glasses and gloves, wash hands and face thoroughly before eating, drinking, and/or smoking! The area may contain unexploded ordnance, identifiable or unidentifiable enemy ordnance, or in aircraft, the emergency escape mechanisms with hatch opening and ejection explosives.

ENVIRONMENTAL PROTECTION

Fuel, oil, and other mechanical fluids spilled on the ground during BDAR operations can cause great damage to the environment. As with many BDAR considerations, the level environmental protection will be mission dependant. Even in periods of heightened conflict, simple steps can help to preserve and protect our fragile environment. All

practical efforts should be made to avoid environmental contamination. Spills over one gallon should be reported through the chain of command to the unit's logistical element, such as the Battalion's S-4.

TOOLS AND EQUIPMENT

The U.S. Army Materiel Command has designed special BDAR kits for ground equipment and Army aviation. These kits were designed for use at the breakdown site to allow the crew or maintenance personnel the capability to perform BDAR without access to special tools and equipment. Normally these kits are located with the MT or the DS MST. A smaller, lighter, and more inexpensive kit is being designed for the operator/crew for use onboard vehicles. BDAR is by no means limited to what can be performed with these kits, but for the first time, crew and maintenance personnel will have materiel and tools on hand specifically designed for BDAR. Vehicle BII, On Vehicle Equipment (OVE) for the USMC, organizational tools, and tools found with the DS contact teams are to be used when available.

HOST NATION SUPPORT MAY BE UTILIZED TO OFFSET PROBLEMS ENCOUNTERED BY UNITS DEPLOYED OVERSEAS

In an actual theater of operations, units will be expected to make extensive use of host nation military and commercial sources to perform BDAR and replenish kits. Each unit is expected and encouraged to modify its kits to suit its special operational needs and geographical environment. See Appendix A for additional information on BDAR kits.

HOST NATION SUPPORT (HNS)

Units deployed overseas find themselves at the end of a long line of communications. In addition, soldiers operate in harsh terrain and less than desirable climatic conditions. Units may expend their basic load of supplies very quickly and may face a long wait for replenishment. Deployment flow may not allow delivery of recovery assets until late in the deployment sequence. To offset these problems, HNS can be used to replenish contents of BDAR kits, and provide recovery assets, material, and equipment. Even in the most remote locations of the world, HNS will usually have industrial sources and automotive repair capabilities. material suitable for recovery. Procurement officers should be able to replenish BDAR kits and obtain other supplies and

tools required to perform BDAR and/or recovery operations. Higher headquarters publish command directives outlining HNS procurement procedures and sources of supply. BDAR kit contents are selected and designed to be replenishable from local sources. Commanders and maintenance personnel must be prepared to avail themselves of this valuable resource.

Host or hostile nation service stations, industrial facilities, and automotive service and supply centers are invaluable sources of supply. Use of local sources must be closely supervised by the responsible field procurement officer. Prompt payment of purchases and payment for rental space and facilities is crucial to maintaining friendly relations with the local population and retaining their support. If using

abandoned HNS or hostile nation equipment that is suitable for BDAR and recovery operations, be sure to gain command approval prior to use. Procurement offices should be involved in the decision.

During operations in a host nation, such as OOTW missions, U.S. forces will comply with all applicable regulations including Status of Force Agreements, treaties, and international agreements. Important to BDAR are the HN laws governing spills such as fuel and oil. If no HN environmental laws exist, as was the case in Operation Restore Hope in Somalia, U.S. forces will follow the laws of the United States. See Appendix B for information on Combined and Multinational BDAR operations.